

TRUST TOWER, WORLD TRADE CENTRE, UAE

Helvar



freedom in lighting



THE WORLD'S LARGEST DALI PROJECT

PROJECT SUMMARY

Abu Dhabi's WTC – Trust Tower is the biggest DALI installation in the world. Featuring a total of 60,000 DALI points and 36,000 DALI light fittings. The huge tower is 100% DALI.

THE DALI SYSTEM

The lighting in the project is DALI controlled and utilises TCP/IP as the main protocol for linking the DALI networks together. No manufacturers' proprietary protocols were allowed as the centre had to use industry accepted standards to promote and increase efficiencies across the whole building. The brief from the client was that the lighting and blind control should be supplied and supported by a single manufacturer, and as such a complete Helvar DALI solution was sourced.

The system has the ability to use the full range of DALI protocol commands and functionality for both day-to-day lighting control and emergency lighting. Using occupancy sensors the system is also able to automatically switch between day and night modes, depending on the level of presence detected by the sensors.

The DALI routers are located within electrical service risers throughout the building. These routers control

individually addressed DALI control devices located within luminaires, or mounted within the ceiling void. These routers control the groups of non-dimming luminaires via DALI relays, for example, the service corridor lights. The system is capable of dimming all fluorescent lamps using digital electronic DALI ballasts and dimming all incandescent sources via DALI controlled dimmers, or transformers which vary the lamp voltage using trailing-edge technology.

Networking 551 routers under one platform with a centralised PC was one of the main challenges for BMTS and Helvar. The solution uses DALI and Tridium Niagara Software, which ensures smooth networking of the Helvar routers. The software also monitors faults and shows error messages for gear failure, lamp failure and router failure. In addition to this, the software provides energy consumption profiles based on selected groups of luminaires, allowing direct landlord billing for energy used.

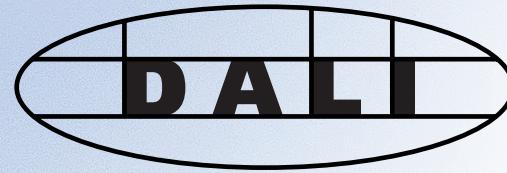
The lighting system at the WTC needed to control and monitor the lamp burning hours for the individual lamps through a DALI protocol. Other key requirements included the creation of different lighting scenes inside and outside of the building and the installation of a sun tracking system. This element links to integrated lighting controls, maximising natural sunlight inside the building and reducing artificial light sources to save energy.

KEY PROJECT DATA

- Realization period/date: 2nd quarter 2013
- Location: Abu Dhabi, U.A.E.
- Architect - Foster & Partners
- MEP Consultant - BDSP Partnership
- Consultant / Client Representative - Atkins Global
- Project Manager - EC Harris
- Main Contractor - Arabian Construction Company
- MEP Contractor - Voltas
- Client – Aldar
- Lighting controls system implementation - BMTS

FACTS AND FIGURES

- Height - 278M
- Floors above ground - 60
- Floors below ground - 5



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FAÇADE CONTROL

The extraordinary building features full façade lighting and control via high power LED's illuminating interior and programming of blinds. The specification required that blinds and lighting should be capable of allowing input of text onto the façade of the building. This was demonstrated and shown on the photo for the UAE 41st anniversary.

SUN TRACKING & BLIND CONTROL

A new set of software has been developed to get the required intermediate positions to achieve the sun tracking system. Correct positioning of the Venetian-style blinds was important to avoid direct sunlight entering the area whilst still allowing maximum daylight harvesting. This requires a response to both the direction and height of the sun with respect to a controlled window. The sun height determines the blind tilt angle response and the window orientation, and shadowing effects determine when the tilt response is required.

The lighting routers and blind controllers are fully integrated into the DALI system. This allows for full automation of the non-intelligent blind motors through the 490 blind control modules and automated control of blinds through the sun-tracking algorithm.

The blinds can be controlled manually through mullion switches. By depressing a switch it is possible to move the blinds up and down to any position. If the switch is depressed for less than 0.5 seconds it will alter the angle of the blind slats. If the switch is pushed for more 2 seconds then the blind will either fully retract or extend. The position of the blind is monitored and after a default fifteen minutes it returns to the last position, ensuring that the building maintains maximum efficiency.

SUMMARY

On a project of this scale, cohesion was needed between all of the BMS systems to ensure reliability and continuity across the complex. Helvar's DALI system ensured the smooth operation of the lighting control system, as well as offering the level of customisation needed to deploy the different lighting requirements for the retail, hospitality and corporate facilities. This is the perfect showcase for DALI controls and being the largest installation in the world, demonstrates its full potential.

HELVAR DALI KIT

36,000 DALI Light Fittings (Fluorescent and LED)

551 Lighting Routers each with 2 DALI Subnets
(Approx 10 per floor for Lighting and blind control)

900 x 312 Multi-sensors for open areas and
stair wells

2500 x 490 Blind control modules

191 x 9242 Touchscreens (Approx 4 per floor)

1250 x 942 Input units (Connect window blind
mullion switches)

1 x Helvar IP Driver (Tridium)